MULTIMEDIA UNIVERSITY®

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2022/2023 (TERM 2215)

BDB2044 – DATA ANALYTICS AND BUSINESS INTELLIGENCE

(All sections/Groups)

19 DECEMBER 2022
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 5 pages with 2 sections.
2. Attempt **ALL** questions in Section A and Section B. The distribution of the marks for each question is given.
3. Please write all your answers for Section A and Section B in the Answer Booklet provided.

SECTION A: STRUCTURED QUESTIONS (60 MARKS)

QUESTION 1

Explain the concepts of 1-tier, 2-tier, 3-tier and N-tier architecture. You can draw diagram for each tier to support your answers. (15 marks)

QUESTION 2

(a) Differentiate between classification and clustering. (5 marks)

(b) Provide **ONE (1)** example of classification. (5 marks)

(c) Provide **ONE (1)** example of clustering. (5 marks)

(Total: 15 marks)

QUESTION 3

Explain in detail and draw diagram(s) to show the difference between star schema and snowflake schema. (15 marks)

QUESTION 4

Country	Product	Gross Sales
Canada	Montana	2000.00
Canada	Paseo	1000.00
Germany	Montana	2000.00
Germany	Paseo	1000.00
Mexico	Montana	2000.00
Mexico	Paseo	2000.00

You are asked to show the gross sales of different products for each country. You are given a table as shown above. Indicate what type of chart is the best to plot these data. Show the steps of plotting the data. After the steps, draw the chart and label accordingly.

(15 marks)

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SECTION B: CASE STUDY (40 MARKS)

BEN & JERRY'S, BIGELOW TEAS, AND BUSINESS INTELLIGENCE

Organizations want information. Organizations need information. However, information must be in an organized format that supports the creation of business intelligence. Otherwise, according to Rebecca Wettemann, vice president of Research at Nucleus Research, "It's like having a bank account with millions of dollars in it but no ATM card. If you can't get it [business intelligence] and can't make it work for you, then it is not really useful."

In support of creating and using business intelligence, companies have focused much of their spending efforts on business intelligence software and data-mining tools. According to a Merrill Lynch survey in 2003, business intelligence software and data-mining tools were at the top of the technology spending list of ClOs. And according to A. G. Edwards, the market for that type of software is expected to grow from $4.7 billion in 2003 to $7.5 billion in 2006.

Consider two companies - Ben & Jerry's and Bigelow Teas - and their approach to creating and using business intelligence.

BEN & JERRY'S

Ben & Jerry's, located in Waterbury, Vermont, produces 190,000 pints of ice cream and frozen yogurt daily and ships to over 50,000 grocery stores in the United States and 12 other countries. Every single pint is meticulously tracked, first by being entered into an Oracle database. With that information carefully organized, Ben & Jerry's uses a sophisticated data-mining tool set from a company called Business Objects.

For example, the sales people can easily monitor sales to determine how much ground Cherry Garcia Frozen Yogurt is gaining on Cherry Garcia Ice Cream, its number one

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selling product. The consumer affairs staff can even correlate each of the several hundred calls and e-mails received each week to the exact pint of ice cream. If complaints are consistent concerning a specific batch, the consumer affairs staff can drill down to the supplier who provided the ingredients such as milk or eggs.

In one particular instance, Ben & Jerry's received a large number of complaints that its Cherry Garcia Ice Cream didn't have enough cherries. The complaints were coming in from all over the country, so it wasn't a regional problem. Employees continued drilling through business intelligence with Business Objects and determined that the manufacturing process (from the supplies of raw materials to the mixing) was satisfactory and had no anomalies. Eventually the problem was determined to be that the ice cream box for Cherry Garcia Ice Cream had on it a photo of frozen yogurt, a product with more cherries than the ice cream. Simply changing the photo on the box solved the problem.

BIGELOW TEAS

Bigelow Teas provides over 50 varieties of flavored, traditional, iced, decaffeinated, and herbal teas. Over the past 50 years, Bigelow Teas has relied on business intelligence to determine the success of each individual tea, and today is no different.

Although it may not seem like it, bringing a new tea to the market is a risky endeavor. It could fail in every way or it could simply cannibalize the sales of an existing tea, neither of which makes business sense. Employees at Bigelow Teas pore over consumer, sales, marketing, and finance business intelligence to ensure that they are making the right decisions in all aspects of the business.

To help facilitate the creation and use of business intelligence, Bigelow Teas turned to the Andrews Consulting Group and BusinessObjects. Prior to using BusinessObjects, Bigelow employees had a difficult time finding and using the right information. As Melanie Dower, project leader at Bigelow Teas, describes it, "Our existing end-user reporting tool

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wasn't user-friendly, so users simply weren't using it. Most users were unable to create their own reports, so we looked for a solution that offered self-serve business intelligence (BI) to free up IT resources." BusinessObjects is both easy to learn and easy to use because it looks like Microsoft Excel. Explains Dower, "Enterprise 6 [of BusinessObjects] looks and feels like Microsoft Excel, which speeds up the learning curve for our end users."

With BusinessObjects, Bigelow employees can access and view business intelligence in real time, more accurately predict sales forecasts based on shipment levels, identify where to increase sales efforts before it's too late, and even compare current consumer, sales, and marketing information with similar types of information up to five years old.

Gourmet coffees exploded onto the consumer market about seven years ago and gourmet teas quickly followed. Bigelow Teas is riding this wave of success with success of its own because of its use of business intelligence.
(Source: Management Information Systems for the Information Age, 6th Ed., McGraw-Hill, pp 150-151)

QUESTION 5

(a) Ben & Jerry's tracks a wealth of information on each pint of ice cream and frozen yogurt. If you were to design Ben & Jerry's data warehouse, which **FOUR (4)** dimensions of information would you include? As you develop your list of dimensions, consider every facet of Ben & Jerry's business operations, from supply chain management to retail store monitoring. (8 marks)

(b) Databases are the underlying technology that allows Ben & Jerry's to track ice cream and frozen yogurt information. Based on your knowledge of databases, what sort of tables or files of information would Ben & Jerry's need in its database? What would be the **TWO (2)** primary keys for each of those? What would be the **TWO (2)** foreign keys among those to create the necessary relationships? (8 marks)

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(c) According to the discussion of Bigelow Teas, part of the success of BusinessObjects comes from its look and feel being similar to Microsoft Excel. Why do you believe this is true? When introducing employees to enterprise-wide BI tools such as BusinessObjects, why is it an advantage to have the BI tool look like and work like personal productivity software tools? Why was a similar look and feel to spreadsheet software more important than word processing or presentation software? Provide **FOUR (4)** reasons. (8 marks)

(d) What are the **TWO (2)** benefits of keeping Bigelow Teas's suppliers and resellers more informed with business intelligence? Which **ONE (1)** type of business intelligence would Bigelow Teas want to exclude its suppliers and resellers from seeing? Why? (8 marks)

(e) Neil Hastie, CIO at TruServe Corporation, once described most decision making in all types of businesses as "a lot of by-guess and by-golly, a lot of by-gut, and a whole lot of paper reports." That statement is not kind to managers in general or to IT specialists charged with providing the right people with the right technology to make the right decisions. What's the key to turning Neil's statement into a positive one? Is it training? Is it providing timely information access? Is it providing everyone with a wide assortment of data-mining tools? Other solutions? Perhaps it's a combination of several answers? Discuss. (8 marks)

(Total: 40 marks)

End of Paper